Sowela Technical Community College

Master Course Outline

Course Name: Elementary Statistics
Course Number: MATH 2100
Lecture contact hours: 45   **Lab contact hours:** 0
Semester Contact Hours: 45   **Semester Credit Hours:** 3 semester hours

Catalog Description:
        Calculation of simple probability in discreet and continuous variable cases. Descriptive statistics; measures of central tendency; binomial, Poisson and normal distributions. Testing hypotheses using normal deviate and t-statistics.

Prerequisites: MATH 1100(College Algebra).
Co-requisites: None

Required Supplies:
        MyMathLab Student Access Code (may be purchased at bookstore or online)
        All students must have a user-friendly calculator with statistical functions
Optional Textbook:
        Elementary Statistics, 11th edition, by Mario Triola, Addison-Wesley, 2010

Student Learning Outcomes:
        Upon successful completion of this course, the student will be able to
- understand the terminology associated with statistics
- collect, organize, and interpret numerical data in various forms
- demonstrate computational skills necessary for problem solving and mathematical modeling
- distinguish between description and inferential statistics
- calculate simple probability in both discrete and continuous variable cases
- understand simple linear regression and be able to demonstrate knowledge of properties
- explore the binomial and normal probability distributions
- understand point and interval estimation of parameters
- perform hypothesis tests about the population mean
- use technology as a means of calculating descriptive statistics, displaying graphical information and solving problems in estimation and hypothesis testing

Assessment Measures:

3-4 Instructor-designed unit exams	60% of semester average
Classroom activities and homework assignments	15% of semester average
Comprehensive, departmental final exam	25% of semester average

Expanded Course Outline:
    I. The Nature of Probability and Statistics
        a. Descriptive and Inferential Statistics
        b. Variables and Types of Data
        c. Data Collection and Sampling Techniques
        d. Observational and Experimental Studies
        e. Uses and Misuses of Statistics
        f. Computers and Calculators
    II. Frequency distributions and Graphs
        a. Organizing Data
        b. Histograms, Frequency Polygons and Ogives
        c. Other Types of Graphs
    III. Data Description
        a. Measures of Central Tendency
        b. Measures of Variation
        c. Measures of Position
        d. Exploratory Data Analysis
    IV. Probability and Counting Rules
        a. Sample Spaces and Probability
        b. The Addition Rule for Probability
        c. The Multiplication Rules and Conditional Probability
        d. Counting Rules
        e. Probability and Counting Rules
    V. Discrete Probability Distributions
        a. Probability Distributions
        b. Mean, Variance, Standard Deviation, and Expectation
        c. The Binomial Distribution
    VI. The Normal Distribution
        a. Properties of a Normal Distribution
        b. The Standard Normal Distribution
        c. Application of the Normal Distribution
        d. The Central Limit Theorem
        e. The Normal Approximation to the Binomial Distribution
    VII. Confidence Intervals and Sample Size
        a. Confidence Intervals for the Mean (σ Unknown and $n \geq 30$) and Sample Size
        b. Confidence Intervals for the Mean (σ Unknown and $n < 30$) and Sample Size
    VIII. Hypothesis Testing
        a. Steps in Hypothesis Testing - Traditional Method
        b. z Test for a Mean
        c. t Test for a Mean
    IX. Correlation and Regression
        a. Scatter Plots
        b. Correlation
        c. Regression